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f a c t s h e e t

Recommended Remediation Actions to Reduce or Eliminate Lead Exposure from Drinking Water in Schools

(Please note this fact sheet may also be used as a guide to reduce or eliminate copper exposure from drinking water. The copper action level is 1.3 mg/l (1300 ppb))

If you are concerned about lead in drinking water or one or more of your school's water samples exceeded **0.015 mg/L, the Massachusetts action level for schools**, the following are recommended remediation actions to be taken by the school to reduce or eliminate lead exposure from drinking water.

A. **If your school has its own well**, it is a public water system and must have a certified drinking water operator. You should contact your school's certified operator and he /she will help you to establish a remediation action plan.

B. **If your school <u>does not</u> have its own well** and it receives water from a local public water department, *the school Superintendent or other designated individual responsible for the health and welfare of your students and faculty* should contact your local public water department to determine if they are in compliance with the Massachusetts Drinking Water Regulations for lead and copper rule. Your local public water department will also advise you on how to evaluate your school and establish a remediation action plan. See section C.4. of this document and visit the Massachusetts Department of Environmental Protection (DEP) website for local public water department contact information – telephone numbers, addresses and phone numbers for all Massachusetts' public water systems at *http://mass.gov/dep/brp/dws/contdwp.htm*

C. **If you have determined that your school needs to develop a remediation plan, the plan should include <u>one or more</u> of the following measures in the order that is appropriate to your school.**

1. Immediately remove from use the sample site(s) with lead concentrations above 0.015 mg/l and post notice(s) at the tap(s) to prevent the use of the tap(s).
2. Start Good Drinking Water Practices (These practices should always be used)
   a) Use only cold water for drinking, cooking classes, preparing beverages and cafeteria meals.
   b) Clean debris from faucet screens (aerators) frequently. Clean and inspect periodically.
   c) Thoroughly flush any holding tanks to remove sediment.
   d) Find alternate grounding for electrical wires that are grounded to water pipes.
   e) Check water coolers to make sure those that were listed by EPA as containing lead are removed.

   More information on lead in drinking water coolers is available at http://www.epa.gov/safewater/consumer/lead_app-a_86-95.pdf

   Note: The cost of these good drinking water practices varies and will be specific to your school.

3. **Use Bottled Water** (short term measure)

a) Replace drinking water coolers and sampling taps that have been found to have lead concentrations above the Massachusetts lead action level with bottled water. Place "Do Not Drink" signs on coolers and taps until they are replaced and/or removed from service.

b) Develop and implement a written procedure on the care and use of bottled water. The procedure should be available for staff and include the name of a designated bottled water coordinator for the school, the minimum number of drinking water stations per school in student-accessible locations in accordance with Massachusetts Public Health and Plumbing Codes, a bottle and cups replacement plan, and a water station maintenance and cleaning plan. For more information see the document titled *Proper Care of Bottled Water and the Dispensers* available at http://mass.gov/dep/brp/dws/lead.htm

c) Use bottled water approved by the Massachusetts Department of Public Health. See list of approved bottled water suppliers at http://www.state.ma.us/dph/fpp/publication_bottled.htm

Note: The cost bottled water delivered to the school would be approximately $8.50 for a 5-gallon bottle. (Dispenser rental: $120-$180/yr or Dispenser purchase: $200-$270.)[1]

4. **Sampling and follow-up sampling** *(Ask your local water department plumbing inspector, Local Board of Health and/or facility manager to assist you in designing a sampling plan)*

Test all drinking water outlets where water is normally collected for drinking or food preparation. Include faucets in kitchens, classrooms, and bubblers (*Test all drinking water outlets that have never been tested for lead or that have had a change anywhere in their plumbing since the last lead test or have previously shown a detection of lead over 0.015 mg/l without any follow-up remediation action.)*

After identifying all the locations that need to be tested, take the following actions:

Sample Collection Procedures

a) Collect all water samples before the facility opens and before any water is used. Ideally, the water should sit in the pipes unused for at least 8 hours but not more than 18 hours before a sample is taken. This time distinction is made to ensure that the water collected is representative of the building's normal water use patterns. At some infrequently used outlets, time gaps may routinely be 18 hours. In such situations, the sample will be representative of the building's normal water consumption pattern for that particular outlet.

b) Make sure that no water is withdrawn from the taps or fountains from which the samples are to be collected prior to their sampling. Samples collected from the designated sites after the taps have been used will indicate lower lead levels. It is important that consistent procedures be used in taking samples so that generalizations about test results can be made.

c) Unless specifically directed to do so, do not collect samples in the morning after vacations, weekends, or holidays. If lead is a problem in your facility, these samples will contain higher lead levels than those collected at other times. Such samples would not be representative of the normal water use patterns within your facility.

d) All water samples collected should be 250 milliliters (ml) in volume. Make sure the sample containers you plan to use will accommodate this volume of water and are properly marked.

- ✓ Take a "first draw" 250 ml sample at each outlet. A "first draw" is the water that is the first to come out of the tap after the period of inactivity.
- ✓ If lead is suspected throughout system, take a 30 second "flush" sample from each outlet(s). A comparison of morning, first-draw samples results, and follow-up (flush) samples results from the same outlet will help you determine whether lead is coming from the outlet itself or from the building's interior plumbing. The flushed sample result is more representative of water being consumed in your school during the day. This sample generally shows a lower lead level. To reduce the cost of analysis a school may request that their certified laboratory only analyze the "flush" sample after the first draw sample for the same site has been analyzed and determined to exceed the Massachusetts action level of 0.015 mg/l.

[1] Consumer Reports.org, January 2003

e) Assign a unique sample ID number to each sample collected that is reflective of the type of outlet and outlet location being tested. Record this ID number on the sample bottle and on your recordkeeping form. On your recordkeeping form, also note such information as the type of sample taken, the date, time of collection, name of the sample collector, the location of the sample site, name of the manufacturer that produced the outlet, and the outlet's model number. Consult the sample form in Appendix E of EPA Document # 812-B-94-002 located at http://www.epa.gov/safewater/consumer/leadinschools.html for additional recordkeeping items.

f) Samples should be sent to a Massachusetts certified laboratory. A list of laboratories certified by Massachusetts DEP is located at http://mass.gov/dep/bspt/wes/files/certlabs.pdf
The laboratory should be reminded to immediately notify the school or responsible party if any lead result exceeds 0.015 mg/l.

Please note schools may perform other sampling to investigate/ identify specific plumbing fixtures or piping of concern.

If any results from the sampling exceed 0.015 mg/l the school should take the following actions:

- Immediately implement one or more of the corrective actions described in this document to reduce the level of exposure below 0.015 mg/l.
- Notify parents, students, local board of health, local water department and local plumbing inspector of the identified problem and the corrective action implemented. A sample notification letter for parents and students is available at http://mass.gov/dep/brp/dws/lead.htm

Note: Cost of sampling, re-sampling, or follow-up sampling is approximately $45-$50/ sample.

More information on sample collection procedures is available from EPA as follows:
Lead in Drinking Water in Schools and Non-residential Buildings at http://www.epa.gov/safewater/consumer/leadinschools.html,
Testing Schools and Daycare Centers at http://www.epa.gov/safewater/lead/testing.htm, and
Sampling for Lead in Drinking Water in Nursery Schools and Daycare at http://www.epa.gov/safewater/lcrmr/nursery.pdf

5. **Flushing** (short or long term measure)
Flush all drinking and cooking water outlets daily for a calculated time (based on size of plumbing system) at the start of each school day and/or whenever a tap is not in use for six or more hours. It is strongly recommended that if a school is using flushing as a long-term measure that it uses automatic flushing devices. Automatic flushing devices should be checked periodically and a log kept. If a school is using a manual flushing procedure it must maintain a daily written flushing log. The flushing log must include the date, time, site of flushing, duration of flushing, and the name and signature of the flushing operator. These logs must be kept on file in a centralized location. See flushing log sample located at http://mass.gov/dep/brp/dws/lead.htm

Note: The amount of water needed to flush a school cafeteria line that is 650 linear feet would be about 6 gallons. This would cost less than $1 per day[2]. *The cost of making staff available 1 hour prior to the start of the normal school day to initiate or oversee flushing must also be added to the cost.*

6. **Re-piping or pipe replacement** (long term measure)
a) Use certified piping components and related materials listed by the National Sanitation Foundation International (NSF) for any alterations made to the existing plumbing system. A licensed plumber must do all modifications to the plumbing system.
b) If a particular location exceeds the lead action level, and is localized, the source of lead can be replaced. If the source of lead is throughout the system, a dedicated pipe for drinking water can be installed.
c) Lead service lines may also be replaced.

[2] Based on 2003 MWRA Water and Sewer Rates

d) If sample sites continue to exceed the lead action level after the implementation of lead abatement measures, these sites should be disconnected.

Note: The approximate cost of re-piping a water cooler by replacing existing copper piping with plastic piping (assuming 2-3 water coolers per floor), would average between $1446 and $2850 per floor. Final cost depends on piping type and length, labor cost, and building configuration.[3]

7. **Installation of treatment**

A treatment device such as a filter could be installed on a designated drinking water line (Point of Use treatment device, (POU)). A treatment device might also be installed for a whole building (Point of Entry treatment device, (POE)). Many of these treatment options, however would cause the school to meet the definition of a public water system. The Massachusetts Drinking Water Regulations 310 CMR 22.02 defines a public water systems (PWS) as "a system for the provision to the public of water for human consumption, through pipes or other constructed conveyances, if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days of the year. Such term includes (1) any collection, treatment, storage, and distribution facilities under control of the operator of such a system and used primarily in connection with such system, and (2) any collection or pretreatment storage facilities not under such control which are used primarily in connection with such system." The Massachusetts Drinking Water Regulations are located at http://mass.gov/dep/brp/dws/regs.htm

The installation of a treatment option is not generally recommended to schools because it is costly and most school departments are not equipped to fully comply with the requirements of being a PWS.

Note: The approximate cost of using reverse-osmosis as a treatment remediation action would include:

- Approximately $300 for installation of the treatment unit.
- Annual operational cost of approximately $116 per year (48 cents per gallon).
- Installation of the treatment would make the school a public water system that would have to comply with the Massachusetts drinking water regulations. This would entail preparing and submitting a public water system and treatment permit application to the DEP for approval, hiring a certified operator, and sampling on a regular basis. DEP would also oversee the system.
  - ✓ DEP permit application fee $240 per unit.
  - ✓ Certified operator annual cost - approximate minimum of $5,000 per year.
  - ✓ Routine sampling/reporting $500 –$5,000 per year depending on the contaminants detected.

  If (despite the cost associated with operating a public water system) a school selects this option it must contact the Massachusetts DEP Drinking Water Program at 617-292-5770 or Program.director-DWP@state.ma.us or Frank Niles at 617-574-6871 or Frank.R.Niles@state.ma.us and be prepared to comply fully with the Massachusetts Drinking Water Standards and Guidelines. Copies of these two documents are available at the following web address: http://gov/dep/brp/dws/regs.htm

  http://mass.gov/dep/brp/dws/standard.htm

D. If a school has identified an exceedence of the Massachusetts schools lead action level of 0.015 mg/l and has instituting remediation measure(s) the school should take the following actions:

1. Re-sample to determine whether the school is now meeting the action levels or whether the school needs to take additional corrective action.
2. Provide educational material to all students and teachers on reducing lead in school drinking water.
3. Maintain all drinking water testing and remediation files in a centralized, clearly labeled file. (E.g. Bottled Water SOP, flushing logs, etc.)

E. DEP strongly recommends that schools maintain all files associated with drinking water testing and remediation in a centralized, clearly labeled file.

[3] VWR Scientific, Cat#63007-310 & 400

F. DEP strongly recommends that all schools routinely (annually) complete the section on Drinking Water in the " *Checklist concerning* ***Environmental Health & Safety in Schools"*** prepared by The Healthy Schools Council, September 2003. This checklist and its supporting information are located at http://www.state.ma.us/dph/beha/iaq/schools/schools.htm